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Broad Field

02 Information Technology

Australian Standard Classification of Education (ASCED)

Reference period: 2001

Released 22/08/2001

Broad Field 02 Information Technology

Information Technology is the study of the processing, transmitting and storage of information by computers.

The theoretical content of Broad Field 02 Information Technology includes:

- computation theory
- computer programming
- data format and coding
- management, storage and retrieval of information in a computer environment
- robotics programming and artificial intelligence
- systems analysis

The main purpose of this broad field of education is to develop an understanding of information systems, programming languages, information management and artificial intelligence, and the ability to apply them to solve problems.

This broad field comprises the narrow fields listed below but excludes:

Computer hardware design and construction. This is included in Detailed Field 031305 Computer Engineering.

Computer operation and using software packages. This is included in Detailed Field 080905 Practical Computing Skills.

0201 Computer Science

Narrow Level 0201 Computer Science

Computer Science is the study of the design and development of computer systems.

The main purpose of this narrow field of education is to develop an understanding of computer languages, computational theory as applied to information technology, and computer networks.

Courses in Narrow Field 0201 Computer Science develop skills in:

- computer programming
- data types and structures
- development and analysis of algorithms
- functions, number handling and computation stability
- two-dimensional and three-dimensional graphical images

This narrow field comprises the following detailed fields:

020101 Formal Language Theory
020103 Programming
020105 Computational Theory
020107 Compiler Construction
020109 Algorithms
020111 Data Structures
020113 Networks and Communications
020115 Computer Graphics
020117 Operating Systems
020119 Artificial Intelligence
020199 Computer Science, n.e.c.

020101 Formal Language Theory

Formal Language Theory is the study of automated formal languages and the algorithms used to recognise them.

Examples of subjects in this detailed field include:

- finite automata
- formal grammars

- language limitations, recognition and representation
- rational languages
- syntax analysis and specification

020103 Programming

Programming is the study of writing coded instructions for computers to perform particular tasks.

Examples of subjects in this detailed field include:

- imperative, functional, logic and object programming paradigms
- iterative and recursive processes
- program development
- software engineering
- specific language written machine codes

020105 Computational Theory

Computational Theory is the study of problems that can be solved using efficient algorithms and the identification of problems that are unsolvable.

Examples of subjects in this detailed field include:

- problem solving

Exclusions:

Numerical analysis. This is included in Detailed Field 010101 Mathematics.

020107 Compiler Construction

Compiler Construction is the study of the theories and techniques for translating instructions between high and low level languages.

Examples of subjects in this detailed field include:

- automated syntax error correction
- code generation
- object programs
- source programs

020109 Algorithms

Algorithms is the study of the processes and rules that describe the logical sequence of

operations to be performed by a program.

Examples of subjects in this detailed field include:

- algorithm analysis
- algorithm application
- algorithm design

020111 Data Structures

Data Structures is the study of the system of relationships between items of data which permit efficient manipulation through reducing complexity.

Examples of subjects in this detailed field include:

- adjacency matrix
- hash
- linked list
- queue
- table
- tree structures

020113 Networks and Communications

Networks and Communications is the study of linking computers for information exchange and distribution.

Examples of subjects in this detailed field include:

- distributive systems
- local area networks
- network architectures
- network organisation
- network protocol

020115 Computer Graphics

Computer Graphics is the study of developing and programming graphical output devices to generate pictures.

Examples of subjects in this detailed field include:

- 2D and 3D graphics systems

- computer animation
- ray tracing
- scan conversion
- shading and texturing
- vector and bit-mapped graphics

Exclusions:

Animation using computers. This is included in Detailed Field 100399 Visual Arts and Crafts, n.e.c.

020117 Operating Systems

Operating Systems is the study of designing and constructing systems to control processes and process scheduling.

Examples of subjects in this detailed field include:

- concurrency and synchronisation
- file systems
- memory management
- multi-tasking systems

020119 Artificial Intelligence

Artificial Intelligence is the study of creating computer programs which demonstrate some of the attributes associated with human intelligence.

Examples of subjects in this detailed field include:

- automated problem solving
- automated reasoning and theorem proving
- expert systems
- game playing
- machine learning
- searching

020199 Computer Science, n.e.c.

This detailed field includes all Computer Science not elsewhere classified.

Narrow Field

0203 Information Systems

Narrow Field 0203 Information Systems

Information Systems is the study of the flow of information, capturing data, and the design and specification of information systems and user interfaces.

The main purpose of this narrow field of education is to develop an understanding of the information management needs of users, and the ability to analyse, design and manage information systems.

Courses in Narrow Field 0203 Information Systems develop skills in:

- conceptual modelling
- database management
- database systems design
- information systems analysis
- information systems management

This narrow field comprises the following detailed fields:

020301 Conceptual Modelling

020303 Database Management

020305 Systems Analysis and Design

020307 Decision Support Systems

020399 Information Systems, n.e.c.

020301 Conceptual Modelling

Conceptual Modelling is the study of representing the structure, type, and relationships of data elements within a system used to support system design.

Examples of subjects in this detailed field include:

- entity relationship modelling

020303 Database Management

Database Management is the study of programs which create and maintain databases.

Examples of subjects in this detailed field include:

- database independence
- distributed databases

- logic based databases
- object oriented databases
- relational databases

020305 Systems Analysis and Design

Systems Analysis and Design is the study of analysing the information needs of the user and designing or modifying a system to meet these needs.

Examples of subjects in this detailed field include:

- data and process modelling
- identifying system components
- general systems theory
- systems software engineering
- systems design
- systems development lifecycle

020307 Decision Support Systems

Decision Support Systems is the study of designing information systems based on statistical and mathematical models to support management decisions.

Examples of subjects in this detailed field include:

- linear and dynamic decision making approaches
- multicriteria design decision making
- optimisation and simulation models
- utilisation of appropriate models

Exclusions:

Expert systems. This is included in Detailed Field 020119 Artificial Intelligence.

020399 Information Systems, n.e.c.

This detailed field includes all Information Systems not elsewhere classified.

Narrow Field

0299 Other Information Technology

Narrow Field 0299 Other Information Technology

This narrow field includes all Information Technology not elsewhere classified.

This narrow field comprises the following detailed fields:

029901 Security Science

029999 Information Technology, n.e.c.

029901 Security Science

Security Science is the study of securing electronic information and preventing unauthorised access to data and programs.

Examples of subjects in this detailed field include:

- computer viruses
- cryptology
- digital signatures
- secure multi-party computation
- smart cards
- system security

029999 Information Technology, n.e.c.

This detailed field includes all Information Technology not elsewhere classified.

Examples of subjects in this detailed field include:

- human computer interaction
- network administration
- systems administration